

# 1. INTRODUCTION — PURPOSE AND BACKGROUND

## 1.1 PURPOSE

There are no upstream or downstream fish passage facilities at any of the five major Yakima Project storage dams in the Yakima River basin.<sup>1/</sup> The lakes and tributaries upstream from these dams formerly supported large runs of anadromous salmonids, and varying amounts and quality of potential spawning and rearing habitat suitable for anadromous salmon and steelhead exist above the dams. Prior to construction of the dams, non-anadromous fish species traveled back and forth between natural lakes and the river below. Two species listed under the Endangered Species Act (ESA), bull trout (*Salvelinus confluentus*) and Middle Columbia River steelhead (*Oncorhynchus mykiss*) would likely benefit from passage at the dams. Passage would also likely benefit chinook salmon (*O. tshawytscha*) and might allow reintroduction of extirpated sockeye salmon (*O. nerka*) and coho salmon (*O. kisutch*).

The Yakama Nation, National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS), and others have urged the Bureau of Reclamation (Reclamation) to build fish passage facilities at Yakima Project storage dams. Recommendations contained in the *Habitat Limiting Factors, Yakima River Watershed, Water Resource Inventory Areas 37-39, Final Report* (WSCC 2001) included restoring passage at the dams. Early in 2001, many Yakima River basin interests saw the proposed Keechelus Safety of Dams (SOD) construction as an opportunity to add fish passage at Keechelus Dam. These interests strongly urged Reclamation to incorporate fish passage features at Keechelus Dam as part of the SOD construction.

Reclamation was unable to build passage features as part of the Keechelus SOD construction. However, in response to the stated concerns, Reclamation negotiated a “mitigation agreement” with Washington Department of Fish and Wildlife (WDFW) and agreed to certain conditions contained in the Hydraulic Project Approval (HPA) permit for the Keechelus Safety of Dams construction. To meet the requirements of the HPA, Reclamation launched this preliminary assessment of fish passage at all the storage dams of the Yakima Project and is seeking funding for detailed feasibility studies that may eventually lead to implementation of fish passage features at the dams.

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1 “Yakima River basin” designates the entire Yakima River watershed, from the Columbia River to the headwaters of the mainstem and all its tributaries;  
“Lower Yakima Basin” is the area downstream from Parker gage (RM 107.1) to the Columbia River;  
“Upper Yakima Basin” is the area upstream from Parker gage to the headwaters of the mainstem and all tributaries;

The study is being conducted in phases. The purpose of this “Phase I Assessment” is to consolidate and document existing habitat information, evaluate preliminary passage concepts, prepare appraisal-level cost estimates for passage options, and identify uncertainties associated with fish passage at the dams where more data and modeling are needed to determine the relative merits of passage. Because of its interest in passage at the storage dams, the state of Washington has provided some funding to assist Reclamation in other program areas so that Reclamation funds can be reallocated for this study.

A core team of technical specialists from Reclamation’s Pacific Northwest Regional Office and Upper Columbia Area Office prepared this assessment. Other technical specialists representing local, State, and Federal agencies, irrigation districts, and other entities provided extensive support for this effort and helped to shape the contents of this report. However, the opinions, assumptions, observations, conclusions, and recommendations are those of Reclamation and do not necessarily represent the opinions or thoughts of the other participants (see Chapter 11).

## 1.2 BACKGROUND

During review of the *Keechelus Safety of Dams Draft Environmental Impact Statement* (USBR 2000b), a large number of comments were received that dealt with the issue of fish passage at Keechelus Dam. All of the fish passage comments were addressed in “Attachment A, Fish Passage Issues” of the *Keechelus Safety of Dams Modification, Final Environmental Impact Statement* (USBR 2001b). *Attachment A* discussed authority for fish passage, design constraints, cost considerations, and biological information. After carefully considering the comments received and the information developed for *Attachment A*, Reclamation decided to proceed with the Keechelus Safety of Dams (SOD) work without providing fish passage features concurrent with the SOD reconstruction.

In the January 2002, *Record of Decision [ROD] for Keechelus Dam Modification* (USBR 2002a), Reclamation committed to seek funding under existing authorities to conduct a feasibility study for fish passage at all of the storage dams that are part of the Yakima Project (the Project). Further discussion and negotiations with the fisheries agencies subsequent to the ROD culminated in two documents — the “Mitigation Agreement” and the “Hydraulic Project Approval” — that summarize the fish passage issues related to Keechelus SOD reconstruction and impose certain requirements on Reclamation in order to proceed with the SOD work. These documents provide the structure for the present assessment of fish passage at the Yakima Project storage dams and are briefly summarized here. The complete text of each is included in Appendix A.

**1.2.1 Mitigation Agreement** — The *Mitigation Agreement between the USDI Bureau of Reclamation and Washington Department of Fish and Wildlife regarding Keechelus Dam Construction Issues Including Fish Passage* was signed on April 8, 2002. The major provisions of the *Mitigation Agreement* are shown below.

- (1) The assessment shall include consideration of the potential fish production and likelihood of sustainability above each dam using a mutually acceptable assessment tool.

- (2) Where fish passage is determined to be desirable and practicable, based on this assessment, Reclamation shall examine engineering feasibility.
- (3) Where fish passage is determined to be impracticable or infeasible, Reclamation shall negotiate with WDFW to provide an alternative to fish passage.
- (4) Reclamation shall seek appropriate funding to ensure timely implementation of:
  - Fish passage facilities, where passage is determined desirable and practicable by the Project-wide assessment.
  - Alternative fish restoration measures for locations where fish passage is determined by the Project-wide assessment to be biologically beneficial but impractical or infeasible.
- (5) Until construction of fish passage facilities at each of the Yakima Project storage reservoirs where fish passage has been determined as necessary as per item (2) above, and such fish passage facilities are in operation, [Reclamation is] to provide interim fish passage (that is, a trap-and-haul program) in collaboration with WDFW at each of those reservoirs.

**1.2.2 Hydraulic Project Approval** — The second document is the *Hydraulic Project Approval* [HPA] for *Safety of Dams Reconstruction of Keechelus Dam* issued by the Washington Department of Fish and Wildlife (WDFW) on April 17, 2002. The *HPA* covers the same provisions as the *Mitigation Agreement* but adds timelines for completion of different phases of the project. The *HPA* requires Reclamation to conduct a Project-wide assessment of fish passage at all Yakima Project reservoirs with Keechelus Dam to be the first facility to be considered (provision 56). The other requirements in provisions 56, 57, and 58 of the *HPA* are summarized below.

**Phase I** (January 2003) — The assessment shall include investigations as to the engineering, constructability and biological considerations of fish passage at each facility.

**Phase II** (January 2004) —

- 1) Prioritize where fish passage is determined to be desirable and practicable, based upon the results of the Phase I assessment.
- 2) Focus on engineering feasibility, cost, water management implications, and biological parameters for restoring specific stocks.

**Phase III** (January 2005)<sup>2/</sup> —

- 1) Provide interim fish passage (that is, a trap-and-haul program) in collaboration with WDFW at facilities where fish passage is desirable based upon the results of the Project-wide passage assessment.

**Phase IV** (to be determined)<sup>3/</sup> —

- 1) Where fish passage is determined to be both desirable and feasible, seek funding and complete design and construction of fish passage facilities in a timely manner.
- 2) Where fish passage is determined to be undesirable or impractical, based upon the results of this assessment, negotiate with WDFW an alternative to providing fish passage.

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2 Not identified as a phase in the *HPA*

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### 1.3 FISH PASSAGE AND KEECHELUS SAFETY OF DAMS CONSTRUCTION

In the *Mitigation Agreement* (paragraph II-8), Reclamation agreed to ensure that SOD reconstruction-related actions at Keechelus Dam would not result in significant additional costs for retrofitting fish passage facilities at the dam nor require future significant modification of the portions of the dam being reconstructed as part of the SOD work.

Correspondingly, Provision 57 of the *HPA* requires Reclamation to:

- Determine whether the proposed design and construction of the SOD project will adversely affect the feasibility, cost, or effectiveness of fish passage facilities at the dam.
- Modify the SOD work if necessary to ensure that SOD reconstruction actions will not cause significant additional costs for retrofitting fish passage facilities nor require future modification of the portions of the dam being reconstructed as part of the SOD work.

As required by the *HPA*, initial study efforts of the Phase I assessment were directed towards review and evaluation of potential fish passage features at Keechelus Dam and the relationship of those features to the on-going SOD reconstruction activities. This review and evaluation confirmed Reclamation's earlier decision to move ahead with the SOD reconstruction while continuing the investigation of the feasibility of providing future fish passage features at Keechelus and the other Yakima Project storage dams.

Through this review and evaluation, Reclamation determined that:

- There would be no significant savings achieved by incorporating fish passage features into the SOD reconstruction as opposed to retrofitting fish passage at a later date. The estimated cost of remobilization and excavation of newly replaced embankment is not substantial enough to warrant modifying existing SOD contracts. The opening of the embankment for retrofitting fish passage features is not expected to require significant changes in operations. Thus, there would be no significant advantage to doing the work in conjunction with SOD construction as opposed to any year in the future.
- The SOD work will not adversely affect the options for constructing fish passage facilities, nor make the construction of fish passage facilities in the future more expensive or more difficult to construct.
- There is no financial or operational advantage to starting passage construction during or in conjunction with current SOD work.

Therefore, considering that passage options have not been narrowed to a single preferred design, and investigations into fish passage strategy and specific design feasibility are still on-going, Reclamation has concluded that it would be unwise to initiate construction of Keechelus Dam fish passage features prior to completion of ongoing studies. More information on the initial assessment of fish passage and Keechelus SOD issues can be found in Appendix E.

## 1.4 PROJECT-WIDE ASSESSMENT

Reclamation has launched a preliminary assessment of fish passage at all of the storage dams of the Yakima Project and is seeking funding for detailed feasibility studies that may lead to implementation of fish passage features at the dams. Reclamation is proceeding with the preliminary assessment in phases as directed by the *HPA*. The *HPA* requires completion of Phase I of the assessment by January 2003 and of Phase II by January 2004. The *HPA* also requires that interim passage (in collaboration with WDFW) be provided at selected sites not later than within a year of completing Phase II.

Reclamation began its assessment of the feasibility of providing fish passage at five dams in the spring of 2002. The first interagency meeting was held in April 2002. Initial efforts were directed towards evaluation of potential fish passage features at Keechelus Dam and the relationship of those features to the on-going SOD reconstruction activities. The interagency core team was comprised of biologists, engineers, and other appropriate specialists from Reclamation, WDFW, National Marine Fisheries Service (NMFS or NOAA Fisheries), U.S. Fish and Wildlife Service (FWS), U.S. Forest Service (USFS), irrigation interests, local governments, and others. A list of participants is provided in Chapter 11. The core team met monthly, and subteams met on several occasions to work through biological, engineering, and operational issues associated with fish passage at the storage dams.

The engineering subteam developed and analyzed various passage options for both upstream and downstream passage of anadromous salmonids and bull trout. The fisheries subteam compiled existing information on habitat conditions in tributaries upstream from the five Project reservoirs to evaluate the potential for restoration of anadromous salmonids in these five watersheds.

This assessment was limited to a compilation and analysis of existing information. Although the team used some limited field observations, systematic collection of new data was beyond the funding and time limitations of this study. Requirements for fish passage and the feasibility and likelihood of restoring sustainable populations of anadromous salmonids is based on existing literature, work in progress on other studies, and professional knowledge.

Miles of tributary habitat potentially available for adult spawning and juvenile rearing is used as an indicator of fish production potential of a watershed. No credible modeling of potential fish production could be done within the limitations of this study, because of the lack of quantified information and the many variables involved.

The team worked with several key assumptions:

- There would be no changes to current operations;
- Fish passage facilities could be designed and operated within the exiting operational considerations and constraints (CCs);
- There would be no impacts to “total water supply available” (TWSA);
- Operations would continue to serve existing Reclamation contracts;
- Potential operation changes that might enhance passage without impacting service to existing contracts or TWSA would be considered in the Phase II study.

